

What is claimed is:

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1. A grinding table for pulverizing solid materials, comprising  
a frame comprising vertical and horizontal members;  
a control unit mounted on the frame;  
a vibrator in communication with the control unit;  
a tray mounted on the frame by at least one resilient member, the tray  
comprising a plurality of sample cells adapted to received a plurality of sample  
containers containing sample material and grinding beads, the tray being in  
mechanical communication with the vibrator; and  
a lid for covering and securing the sample containers, the lid adapted to be  
secured to the tray,  
wherein the grinding table is adapted to generate both horizontal and vertical  
motion of the grinding beads in the sample containers.
  2. A grinding table as in claim 1, wherein the vertical members of the frame are  
spaced apart to support the horizontal members, the horizontal members forming a  
substantially rectangular top portion.
  3. A grinding table as in claim 1, wherein the tray is connected to the frame by a  
plurality of resilient members.
  4. A grinding table as in claim 3, wherein the resilient members are coiled  
springs.
  5. A grinding table as in claim 1, wherein the vibrator is a rotary electric vibrator.
  6. A grinding table as in claim 1, wherein the vibrator is mounted in contact with  
a bottom surface of the tray.

7. A grinding table as in claim 1, wherein the control unit is an electrical control unit comprising a start button, a stop button, a speed display, a speed control, a disconnect switch, and a process timer.
8. A grinding table as in claim 1, wherein the tray further comprises at least one clamp adapted to secure the lid to the tray.
9. A grinding table as in claim 1, wherein the plurality of sample cells comprises from about 50 sample cells to about 165 sample cells.
10. A grinding table as in claim 1, wherein the plurality of sample cells comprises at least about 150 sample cells.
11. A grinding table for pulverizing solid materials, comprising  
a frame comprising vertical members spaced apart to support horizontal members, the horizontal members forming a substantially rectangular top portion;  
an electrical control unit mounted on the frame, the electrical control unit comprising a start button, a stop button, a speed display, a speed control, a disconnect switch, and a process timer;  
a rotary electric vibrator in communication with the electrical control unit;  
a substantially rectangular tray mounted on the frame by coiled springs attached at an upper end proximal to corners of the tray and at a lower end to corresponding positions proximal to corners to the rectangular top portion of the frame, the tray comprising a plurality of sample cells adapted to received a plurality of sample containers containing sample material and grinding beads, the tray being in mechanical communication with the rotary electric vibrator; and  
a lid for covering and securing the sample containers, the lid adapted to be secured to the tray by a plurality of clamps which are attached substantially at a midpoint of each side of the tray.

12. A grinding table for pulverizing solid materials, comprising
  - a frame comprising vertical and horizontal members;
  - a control unit mounted on the frame;
  - a driver in communication with the control unit;
  - a series of mechanical linkages comprising a counterbalanced cam mechanism in communication with the driver;
  - a tray mounted on the frame via mechanical linkages, the tray having a plurality of sample cells adapted to received a plurality of sample containers containing a sample and grinding beads, the tray being in mechanical communication with the mechanical linkages which are in communication with the driver; and
  - a lid for covering and securing the sample containers, the lid adapted to be secured to the tray,
  - wherein the grinding table is adapted to generate substantially uniform grinding of the samples by the grinding beads in the sample containers held by the tray.
13. A grinding table as in claim 12, wherein the series of mechanical linkages in communication with the driver and the mechanical linkages mounting the tray to the frame are adapted to provide motion to the tray comprising both a horizontal and vertical component.
14. A grinding table as in claim 12, wherein the tray is mounted on the frame via mechanical linkages which further comprise pillow block bearing assemblies mounted in corresponding positions on a bottom surface of the tray and on a top portion of the frame, and wherein each corresponding pair of pillow block bearing assemblies is connected by at least one bearing connecting link.
15. A grinding table as in claim 12, wherein the driver is an electric motor.

16. A grinding table as in claim 15, wherein the electric motor is mounted to the frame.
17. A grinding table as in claim 16, wherein the electric motor comprises a drive shaft which communicates with an end cam follower and an associated bearing assembly linked to a connector rod which is connected at an opposite end to a pillow block bearing assembly mounted on a bottom surface of the tray.
18. A grinding table as in claim 17, wherein the end cam follower bearing is associated with a table motion counterweight.
19. A grinding table as in claim 12, wherein the tray further comprises at least one clamp adapted to secure the lid to the tray.
20. A grinding table as in claim 12, wherein the plurality of sample cells comprises from about 50 sample cells to about 165 sample cells.
21. A grinding table as in claim 12, wherein the plurality of sample cells comprises at least about 150 sample cells.
22. A grinding table as in claim 12, wherein the series of mechanical linkages comprises a crankshaft.
23. A grinding table for pulverizing solid materials, comprising  
a frame comprising vertical and horizontal members, the horizontal members forming a substantially rectangular top portion;  
a tray comprising a plurality of sample cells adapted to receive at least about 50 sample containers containing a sample and grinding beads and a plurality of clamps for attachment of a lid, the tray being mounted on the frame by mechanical linkages comprising pairs of pillow block bearing assemblies mounted on a bottom surface of the tray and in corresponding positions on a top portion of the

frame, each corresponding pair of pillow block bearing assemblies being connected by at least one bearing connecting link;

an electric motor mounted on the frame and comprising a drive shaft which communicates with an end cam follower and an associated bearing assembly comprising a table motion counterweight, the end cam bearing being linked to a connector rod which is connected at an opposite end to a pillow block bearing assembly mounted on a bottom surface of the tray; and

a lid for covering and securing the sample containers, the lid adapted to be secured to the tray via the plurality of clamps,

wherein the grinding table is adapted to generate uniform motion of the grinding beads in the sample containers held by the tray and wherein the series of mechanical linkages in communication with the driver and the mechanical linkages mounting the tray to the frame are adapted to provide motion to the tray having both a horizontal and vertical component.

24. A grinding table for pulverizing solid materials, comprising,
- a means for supporting the components of the table;
  - a means for providing motion to moving parts of the table;
  - a means for controlling the means for providing motion;
  - a means for securing from about 50 sample containers to about 150 sample containers, the means for securing in communication with the means for providing motion;
  - means for connecting the means for securing and the means for supporting;
  - means for connecting the means for securing and the means for providing motion; and
  - wherein the means for connecting is adapted to provide motion comprising both a vertical and horizontal component to the means for securing the sample containers.
25. A process for achieving uniform and reproducible pulverization of friable solids utilizing a ball-mill type action, the process comprising,

securing from about 50 to about 150 sample containers comprising individual samples and grinding beads in a tray;  
moving the tray vigorously such that motion of the tray comprises both a horizontal and vertical component.

26. A process according to claim 25, wherein at least about 150 sample containers are secured in the tray.

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